

### REMARKS

By the above Amendment, previously withdrawn Claims 71-130 have now been cancelled without prejudice or disclaimer. Thus the Claims now in the case are Claims 131-151. As noted in a prior Response, the subject matter of withdrawn (and now cancelled) Claims 71-130 is being carried forward in continuing Application No. 12/480,021, filed June 8, 2009, containing 20 claims.

The amendment made to the Specification above does not add new matter to the Specification. In particular, Applicants note that the added phrase is derived from U.S. Serial No. 09/088,300 (now issued U.S. Patent No. 6,068,861). See U.S. Patent No. 6,068,861, column 5, lines 14-16. Example 2 of the present Specification, equivalent to Example 4 of U.S. Patent No. 6,068,861, has been amended to include the phrase "after 6 weeks of storage at ambient temperature indicated that it".

Entry of the above amendments is requested on the ground that they place the case in condition for allowance or at least in better condition for appeal. Additionally, the Final Office Action mailed on September 17, 2009, was the first Office Action containing an examination of Claims 135-151 (Claims 131-134 embody subject matter of original Claims 61, 62, 64, and 65. Thus, this Response to the Advisory Action and the filed Response to the Final Office Action mailed on September 17, 2009, afford the first opportunities for a reply on behalf of Applicants to be submitted to the Rejection of Claims 135-151.

We turn now to the Final Rejection mailed September 17, 2009, and the Advisory Action mailed on December 7, 2009.

The Examiner's comments in the Advisory Action further explaining the present rejection are noted with appreciation.

#### **Rejection under 35 U.S.C. § 103(a)**

Claims 131-151 stand rejected under 35 U.S.C. §103(a) on Goodenough et al. (U.S. 3,588,503, hereinafter "Goodenough") in view of Dallmier et al. (U.S. 5,683,654, hereinafter "Dallmier") and the Second Declaration of McKinnie (hereinafter "McKinnie").

Applicants submit that McKinnie is inapplicable to the present rejection. McKinnie compares the amounts of N-bromosulfamate and N-chlorosulfamate formed when using bromine chloride versus bromine and chlorine. The present claims are directed to the use of bromine, not bromine chloride or bromine and chlorine, to produce the biocide formulations.

The present claims are process claims. Goodenough and Dallmier teach incompatible processes for forming halogen-based biocidal solutions. More specifically, Goodenough discloses that an aqueous solution of bromine is contacted with a bromine value stabilizer (*e.g.*, sulfamic acid) and sufficient hydroxide to form a solution having a pH of 8 to 10 (column 2, lines 1-6). Goodenough further states that the order of addition is not critical (column 2, lines 10-12). Conversely, the Dallmier order of addition is critical, as pointed out in column 6, lines 33-36 and in column 7, lines 51-52. In Goodenough, the halogen is added to the solution second (Example 3, solution A) or last (Example 3, solution B); in both instances, the stabilizer (sulfamic acid) is already present in the solution. Dallmier insists that the halogen be added first and that a period of time pass before a stabilizer (alkali metal sulfamate) is added.

The Final Office Action states that an artisan would have been motivated to combine the teachings of Goodenough and Dallmier to include a step of increasing the pH of the final solution to 12-14 as indicated in Dallmier in order to minimize formation of the suspected carcinogen bromate during storage (Page 3, last paragraph). However, that is not what is presently claimed. The present claims involve no step of increasing the pH of a final solution, but instead provide a substantially uniform pH of about 12 to about 14 throughout the process, a feature which would not have been obvious to one of ordinary skill in the art from the combination of Goodenough and Dallmier.

Goodenough observes that the stabilization of the bromine values is better when hydroxide is added to the solution last (column 2 lines 12-15, emphasis added; see also Example 3). Dallmier states that the pH of the solutions therein can be 8-14, preferably 11-14 (column 4, lines 47-49). In Example 1 of Dallmier, the only part of the disclosure addressing the addition of base, the base is added to the solution last. Hence, the only

common feature of the processes of Goodenough and Dallmier is a preference or requirement for adding hydroxide (base) last. In contrast, in the presently claimed processes, enough base is present from the beginning of the processes so that the pH is about 12 to about 14 throughout the process.

Also germane to the addition of base in the processes is bromate formation. The United States EPA suggests a connection between animal carcinogenesis and the presence of low bromate levels found in drinking water (Dallmier, column 3, lines 20-22). Bromate may form via the disproportionation of hypobromite; the disproportionation occurs at an increased rate in alkaline environments (Dallmier, column 3, lines 24-28). Therefore, Dallmier teaches that it is unfavorable to conduct processes for formation of the biocide solutions at high pH values. This strongly discourages other points of addition for the base in such processes, because Dallmier teaches that it is best to stabilize the bromine values before increasing the pH of the solution, and reinforces that the base should be added last.

As already stated, the present claims need not have a step to increase the pH to about 12 to about 14 because the pH is kept in that range throughout the process. The combination of Goodenough and Dallmier does not make obvious a process in which the pH is at a high value at all times during the process. Furthermore, Claims 131-134 use the phrase "consisting of", which does not permit an additional step of adding base to reach a pH of about 12 to about 14.

Furthermore, a reference must be considered for all that it teaches, *Beckman Instruments v. LKB Produkter AB*, 892 F.2d 1547, 1551, 13 U.S.P.Q.2d 1301, 1304 (Fed. Cir. 1989), including portions that teach away from combination/claimed invention. Thus, it is not proper to cite Dallmier for its teaching that the pH of the final solution is 12-14, while ignoring Dallmier's disclosures regarding the halogen source and the order of addition.

Turning now to another facet of the processes, Goodenough uses bromine (Br<sub>2</sub>) as the halogen source. In sharp contrast, Dallmier does not use diatomic halogen molecules. Instead, Dallmier combines an aqueous hypochlorite solution and an aqueous bromide source, followed by addition of an aqueous alkali metal sulfamate. Clearly, Dallmier does

not employ diatomic halogen molecules to form the biocides taught therein. In fact, Dallmier explicitly discourages use of bromine as taught by Goodenough. For example, at column 2, lines 28-32, Dallmier states:

Because elemental bromine is used in the process disclosed in the Goodenough, et al. reference, this process is difficult to complete as well as potentially hazardous since elemental bromine is a fuming, corrosive, toxic liquid.

Thus, Dallmier explicitly teaches away from combination with Goodenough. contrary to the statement in the Advisory Action (Continuation Sheet, second paragraph), the Br<sub>2</sub> taught in Goodenough is elemental bromine. Dallmier states that the reaction according to this process [of Goodenough] is as follows: Br<sub>2</sub> + H<sub>2</sub>O → HOBr + HBr (column 2, lines 38-42). When coupled with the statements in Goodenough at column 1, lines 29-32, that upon addition to water, bromine forms both the bromide ion (Br<sup>-</sup>) and hypobromite ion (BrO<sup>-</sup>), it is clear that bromine, Br<sub>2</sub>, is elemental bromine.

Claims 135-151 are directed to continuous processes. In these claims, only two feeds are required, the bromine and the aqueous solution of alkali metal salt of sulfamic acid having a pH of at least about 12. Neither Goodenough nor Dallmier (much less their untenable combination) teaches or suggests anything other than the separate feeding of all of the required components. Both Goodenough and Dallmier both feed three components: halogen, a base, and a stabilizer (sulfamic acid or sulfamate salt). This is shown more clearly in the table below.

Component	Goodenough	Dallmier
Halogen	Br <sub>2</sub>	hypochlorite + bromide (aq.)
Stabilizer	sulfamic acid	alkali metal sulfamate (aq.)
Base	hydroxide	hydroxide (aq.)

Since there is nothing in the cited references would have suggested to an artisan of ordinary skill that the components can be co-fed, much less in a continuous manner, Claims 135-151, all of which are directed to continuous processes needing only two feeds, are patentable over the cited references.

For all of the foregoing reasons, in combination with Dallmier, Goodenough is not suggestive of the processes in Applicants' claims, and it is respectfully requested that this rejection be reconsidered and withdrawn.

On the basis of the foregoing comments, it is believed that the Rejection based on Goodenough, Dallmier, and the McKinnie Declaration is inapplicable and untenable. Accordingly, reconsideration and withdrawal of the rejection are respectfully solicited.

If matters remain requiring further consideration, the Examiner is respectfully requested to telephone the undersigned so that such matters may be discussed and, if possible, can be promptly resolved.

Please continue to address all correspondence in this Application to Albemarle Corporation, at their address of record.

Respectfully submitted,  
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